PROGRESS REPORTS

FROM

EXPERIMENT STATIONS

SEASON 1952-53

SURVEY OF REPORTS

PUBLISHED BY

THE EMPIRE COTTON GROWING CORPORATION,
12 CHANTREY HOUSE, ECCLESTON STREET,
LONDON, S.W.1.

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PROGRESS REPORTS FROM EXPERIMENT STATIONS. SEASON 1952-53.

A full list of the reports published for the season 1952-53 is given below; the price post free is 7/6d. for the set of 12, or 9d. each for individual reports.

1. Cotton Research Station, Namulonge, Uganda.
2. Anglo-Egyptian Sudan.
3. Kenya—Nyanza Province.
4. Tanganyika—Lake Province.
5. ,, —Eastern Province.
6. Nyasaland.
7. Southern Rhodesia.
8. Northern Nigeria.
9. Aden.
10. West Indies.
11. Queensland, Australia.
12. Survey of Reports for 1952-53.

NOTE.

The progress reports published for the season 1952-53 cover four aspects of the Corporation's work.

(1) The report from the Cotton Research Station at Namulonge in Uganda. This is the only station at which members of the Corporation's staff are working which can be described as a Corporation Station. It is staffed by the Corporation, who finance it with the aid of grants made by the Colonial Office and the Governments of Uganda, Tanganyika, Nigeria, Kenya, Nyasaland and the Anglo-Egyptian Sudan.

(2) At other stations, in the Sudan, Kenya, Tanganyika, Nyasaland, Nigeria and the West Indies, members of the Corporation's staff are working on Government Experiment Stations, and are provided by the Governments concerned with housing and laboratory facilities and local field staff.

(3) The report from Aden has been contributed by a member of the Corporation's staff with long experience in the Sudan, who was seconded to that country for part of the season, in order to help to establish the new cotton growing industry on sound lines.

(4) Reports from Queensland and Southern Rhodesia have been written by staff employed by the countries concerned and not by officers of the Corporation. They have, however, been included in this series, by courtesy of the Governments, in view of the fact that the present work is a continuation of cotton research work started many years ago by the Corporation.

SURVEY OF PROGRESS REPORTS FOR THE SEASON 1952-53.

BY

J. B. HUTCHINSON.

General.

Total production in the territories covered by these reports (see Table on p. 7) reached over a million bales in 1952-53, the second highest figure on record. This increase was due almost entirely to the larger crop in the Anglo-Egyptian Sudan; in the raingrown areas of Africa the season was not so good as 1951-52, but there was further evidence of real progress in developing larger crops. Northern Nigeria produced 95,000 bales, and the Lake Province of Tanganyika, in one of the worst seasons on record as far as rainfall was concerned, reaped 38,000 bales, which would until recently have been accepted as an average crop.

Crop Husbandry.

The importance of timely planting in determining crop yield was again emphasised by experience at Namulonge, Uganda; Ukiriguru, Tanganyika; the Lower River, Nyasaland; and Samaru, Nigeria. Physiological studies at Namulonge provided data on the differences in plant growth and structure that resulted in these differences in yield.

"On-the-spot" soil and water conservation by tie-ridging continues to give excellent results, except where soil permeability is low and waterlogging occurs after heavy rain. Even where no increases in yield have so far followed tie-ridging, as at Namulonge, the long-term value of the system as a means of preventing soil movement is considered to justify its use.

Results from fertiliser trials follow the pattern of previous years, the most striking responses being those to phosphate and nitrogen in the Lake Province of Tanganyika and to nitrogen in St. Vincent. Nitrogen fertilising has been a regular plantation practice in St. Vincent for some years and the application of phosphate and nitrogen to peasant farms has now been started by the Lake Province Cotton Committee in Tanganyika.

In other areas, responses to fertilisers have been small or irregular. Even in Nigeria, where phosphate generally gives a marked increase in yield, the response was disappointing. It is perhaps worth noting that one reason why responses to fertilisers in Africa are not usually

either large or consistent is that it is in those areas where mineral nutrients are fairly adequate that large agricultural populations have been built up. The intrinsic fertility of the hill sands at Ukiriguru, for instance, is sufficiently indicated by the yield of 922 lb. seed cotton per acre from the 12th continuous cotton crop on the Exhaustion Plot. By contrast, there are undoubtedly large tracts of empty land in areas of good rainfall in Africa that will only be successfully settled when their mineral deficiencies have been identified and put right.

Cotton Quality.

Studies of cotton quality, which have until recently been limited to the range of enquiry covered by the standard spinning test, are now developing over a wider field. It has long been known that immature hairs are not distributed at random on the cotton seed. Evenson at Namulonge has drawn attention to the importance of this information for the study of nep, and is developing techniques to enable the plant breeder to estimate, and to breed against, proneness to nep. An interesting indication of the importance of environment in determining lint quality is provided in the West Indies report. East African cottons as a group gave considerably higher yarn strengths when grown in Antigua than when grown in their native areas, thus providing evidence from a group of Uplands in support of the view that the high quality of Sea Island cotton depends on the climate of the West Indian islands as well as on the breeding of West Indian cottons.

Plant Pathology.

Seasonal variations in intensity of bacterial blight are well illustrated. At Samaru in Nigeria, the attack was worse than usual, and differences in resistance between strains of 26C were shown up in a way that had not previously been noted. At Ukiriguru, in Tanganyika, on the other hand, damage from the disease was the lightest recorded in nine seasons. In 1952-53 no appreciable benefit resulted from rotating cotton with bulrush millet, thus supporting the previous year's conclusion that the increase resulted from the absence of trash-borne blight infection. When blight was not serious, trash carry-over had no effect. Seed dusting trials in Nyanza, Kenya, showed that seed disinfection resulted in improved stands and, where stand was critical, in better yields. Boll inoculation experiments at Namulonge have shown beyond doubt that a strain with high leaf and stem resistance may be susceptible to bacterial boll disease. Unfortunately, boll inoculation is tedious, and the inoculated material is subject to heavy incidental losses, so that breeding for boll resistance is not so easy as breeding for stem resistance.

Entomology.

All the work of the year emphasises the importance of assessing the losses from insect pests before considering insecticidal control. Moreover, it is becoming abundantly clear that insect control must be considered in terms of crop protection as a whole. Controlling one pest at a time exposes the crop to grave risks from other insects. Success with insecticides has so far been limited to crops such as those at Gatooma in Southern Rhodesia and Ilonga in the Eastern Province of Tanganyika, where a single pest is capable of taking the whole crop. In the Sudan, though jassid is controlled by spraying, whitefly is a worse pest than it used to be. In Nigeria considerable success has been achieved in controlling one pest at a time, but a satisfactory control for the whole pest complex will still need to be worked out. Successful insect control by methods other than insecticide applications has been achieved in the Lower River area of Nyasaland by early planting and the establishment of a close season adequate to break the life cycle of the red bollworm, and control appears to be maintained over pink bollworm in northern Nigeria by the action of saw gins in destroying resting larvae in the seed. On the other hand, the demonstration at Ukiriguru that appreciable American bollworm attack may occur on close-panicled sorghum is a warning that the delicate balance between this pest and the cotton crop might be upset by the breeding of new successful strains of another crop.

Genetics and Plant Breeding.

Interesting and important work on the genetics of hairiness is reported from Shambat in the Sudan. Its plant breeding significance is in the synthesis of jassid resistant types of Sudan Egyptian cottons. The genetic aspects of the work have been written up in the Journal of Genetics.

The genetics of bacterial blight resistance has been dealt with comprehensively at Shambat, and blackarm resistance studies are now largely in the field of breeding resistant varieties.

The synthesis of polyploids continues and the attempt to achieve some of the more difficult transferences, such as those of high lint strength and bollworm resistance, has been renewed.

There are now two approaches to the breeding of strains resistant to bacterial blight. The Sudan approach is to add B_{6m} to B_2. B_{6m}, which was transferred by Knight from an Asiatic cotton, has hitherto only been available on a *barbadense* background, but transference to BP52 is in progress at Shambat. Most breeding for high resistance in Upland is at present based on the Albar stock from Namulonge. Rapid progress is being made, but the importance of the

problem justifies both approaches, and it is to be hoped that B_{um} stocks will be more widely used by Upland breeders. It is now evident that a cotton cannot be regarded as fully satisfactory under African conditions unless it is resistant both to jassid and to bacterial blight. Neither the Albar nor the B_{um} stocks now available carry adequate resistance and the combination must, therefore, be made by hybridisation. Hybrid stocks of this type are under development at Shambat, Namulonge, Ukiriguru, and Gatooma.

Precise methods of testing the products of breeding work under commercial conditions are in force in most territories. A trial of particular interest is the seed stocks trial in Nigeria in which successive waves of 26C are compared against commercial Allen from the Mai Inchi ginnery area. The yield and ginning outturn data are an object lesson in the consequences of varietal contamination, and emphasise the importance of a wave by wave follow up of a new seed issue.

The value of 26C in Nigeria and of the new Uk series of issues in the Lake Province of Tanganyika is well illustrated by the strain trial results. The new strains have contributed handsomely to the increases in crop size in these two areas in recent years.

In view of the importance of maintaining and improving the supply of high quality cottons from Commonwealth sources, the continued success of Sudan X1730 in Aden is satisfactory. The high quality strain 47/10 is now in multiplication in eastern Tanganyika and better yielding stocks of BP52 are in an advanced stage of development in Uganda. Unfortunately trials of Egyptian types under irrigation in the Lower River area of Nyasaland have proved disappointing. It is now clear that even if irrigation is made available, Upland type cottons will still be the most profitable.

Received June 1954.

CURRENT COTTON CROPS.

(in bales of 400 lb.)

	Record Crops		*Production*		
	Season	*Amount*	1921-22 (*when the Corporation was established*)	*Average 3 years* 1949-50 to 1951-52	1952-53
Anglo-Egyptian Sudan ...	1950-51	526,592	24,074	399,815	*485,815*
Uganda	1937-38	417,179	48,290	355,519	320,147
Kenya	1936-37	22,166	417	12,763	9,411
Tanganyika	1951-52	79,171	7,175	58,783	*49,254*
Nyasaland	1934-35	21,006	5,422	8,989	15,854
Northern Rhodesia	1925-26	506	80	100	206
Southern Rhodesia	1951-52	9,563	nil	6,250	3,111
South Africa and Swaziland ...	1951-52	34,568	2,740	18,843	23,133
Nigeria*	1951-52	113,510	15,096	84,170	95,758
West Indies	1940-41	9,312	4,314	5,848	4,221
Australia	1933-34	21,924	3,140	1,438	5,169
Aden	1952-53	10,396	nil	6,249	10,396
Cyprus	1934-35	5,214	1,505	3,271	2,288
Ceylon	1948-49	840	nil	473	500
Total	1950-51	1,054,778	112,253	962,511	*1,025,263*

*Exports only. Figures in italics are estimates.

Note.—Cotton growing in Aden started only in 1948, and the rapid progress made since can be seen from the following production figures.

1948-49	120	bales
1949-50	1,587	,,
1950-51	9,954	,,
1951-52	7,206	,,
1952-53	10,396	,,

EMPIRE COTTON GROWING CORPORATION

12 CHANTREY HOUSE, ECCLESTON STREET, S.W.1.

List of Publications issued to date. Those still in print can be obtained direct from the Corporation at the above address. Those out of print are marked with an asterisk. The prices include postage.

GENERAL AND TERRITORIAL.

"Cotton Growing within the British Empire and the World's Capacity for Consuming Cotton Goods." J. W. McConnel. 1921. Price **2s.**

* "Cotton Growing in Nigeria." Sir Hector Duff. 1921.

"The Extension of Cotton Cultivation in Tanganyika Territory." Major Hastings Horne. 1922. Price **2s.**

* "Cotton Cultivation in Nyasaland." H. C. Sampson. 1922.

* "Cotton Growing within the British Empire." L. G. Killby. 1924.

"Cotton Growing in South Africa." G. F. Keatinge. 1925. Price **2s.**

"A Cotton Research Station for the British Empire." Professor J. B. Farmer and Mr. L. G. Killby. 1925. Price **2s.**

"Report on the Cotton-Growing Industry in Uganda, Kenya, and the Mwanza District of Tanganyika." Col. C. N. French. 1925. Price **1s. 3d.**

"Memorandum by the Mechanical Transport Sub-Committee." Mr. G. H. Baillie, Mr. R. H. Brackenbury, Col. C. N. French. 1925. Price **2s.**

"Report on the Cotton-Growing Industry of Nigeria, 1926." Col. C. N. French. 1926. Price **2s.**

* "The Principles and Practice of Yield Trials." F. L. Engledow and G. Udny Yule. 1926.

"Report on Suitable Rotation Crops for Cotton." H. C. Sampson. 1927. Price **1s.**

"Cotton Growing in Southern Africa and the Rhodesias." Report on a Tour undertaken by Sir James Currie, Mr. J. S. Addison, and Mr. H. C. Jefferys. 1927. Price **2s.**

* "Reports from Turkestan Plant Breeding Station, Tashkent." 1928.

"Review of the Situation in the Principal Cotton-Growing Territories of the Empire, and a Summary of the Main Activities of the Corporation since their Formation." 1928. Price **9d.**

"Report on Cotton Breeding and Seed Supply in Nigeria, 1928." F. L. Engledow and C. N. French. Price **2s.**

* "Conference of Workers on Cotton-Growing Problems, held August, 1930." Papers and Discussions.

"Conference of Workers on Cotton-Growing Problems, held July, 1934." Papers and Discussions. Price **2s 6d.**

* "The Principles and Practice of Field Experimentation." J. Wishart and H. G. Sanders. 1935.

"Cotton Pest Control Work in Southern and Central Africa and the Rhodesias." J. W. Munro. 1937. Price **2s. 6d.**

"Conference of Workers on Cotton Growing Problems, held September, 1938." Report of Proceedings and Papers submitted. Price **2s. 6d.**

"Spinning Test Methods—Shirley Institute, 1948." C. Underwood. 1949. Price **1s.**

* Out of print.

"Field Key to the Principal Disorders of Cotton in Africa." E. O. Pearson. 1950. Price **6d.**

"Short History of the Empire Cotton Growing Corporation, 1921 to 1950." 1951. Free.

"Empire Cotton Growing Corporation." An illustrated booklet describing the functions and achievements of the Corporation. 1952. Free.

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In print (in seasonal volumes only): 1923-25 (one volume, price **2s.**); 1926-27, 1931-32, 1934-35, 1935-36 (price **2s. 6d.** each); 1942-43, and 1945-46 to 1950-51 (price **3s.** each).

From 1951-52 published in 12 sections each season, price **9d.** each or **7s. 6d.** the set.

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No. 18. The Genetics of Jassid Resistance in Cotton. II. Pubescent T611. III. The Kapas Purao, Kawanda *punctatum* and Philippines Ferguson Group. IV. Transference of Hairiness from *Gossypium herbaceum* to *G. barbadense*. R. L. Knight and J. Sadd. 1954.

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